REMARKS

Status of the Claims

Claims 1, 3-12, 14, 16-26, and 28-32 and 34-42 are pending in the application, Claims 1, 3-4, 6-8, 10-11, 14, 16-26, 29, 31, 32, and 35-37 having been amended, new claims 35-37 having been added, and Claims 2, 13, 15, 27, and 33 having been previously canceled. These amendments further clarify the claims and also tend to place the claim set generally in a state similar to that presented when this application was first filed. Minor typographical errors have also been corrected. Please note that Claim 17 has NOT been canceled or "withdrawn from consideration," as was erroneously indicated under the "Disposition of Claims" section of the Office Action Summary page (form PTOL-326). Also note that new Claims 38-42 respectively generally correspond to the previously canceled Claims 2, 13, 15, 27, and 33.

Amendment to the Title

Please note that the title has been amended as set forth above, from "LOSSLESS MANIPULATION OF IMAGES," to "LOSSLESS MANIPULATION OF MEDIA OBJECTS."

Claims Rejected under 35 U.S.C. § 103(a)

The Examiner has rejected Claims 1, 3-12, 14, 16, and 18-30 as being unpatentable over Sull et al. (U.S. Patent Application Publication No. 2002/0069218 hereinafter referred to as "Sull") and further in view of Wee et al. (U.S. Patent No. 6,553,150 hereinafter referred to as "Wee"). The Examiner asserts that it would have been obvious to one skilled in the art at the time of the invention to use the encoding process that indicates how each ICR (independent coding region) is to be "sliced" (see column 11, lines 10-32 of Wee) to modify editing of multimedia files (section 0002) of Sull because as detailed in column 11, this process results in optionally editing a portion of the bit stream without having to completely decode each entire area of interest as indicated by an optional process block 125. Applicants respectfully disagree with this reasoning and with the rejection of the claims for the reasons noted below.

In the interest of reducing the complexity of the issues for the Examiner to consider in this response, the following discussion focuses on independent Claims 1, 14, 25, 31, 36, and 37. The patentability of each dependent claim is not necessarily separately addressed in detail. However, applicants' decision not to discuss the differences between the cited art and each dependent claim should not be considered as an admission that applicants concur with the Examiner's conclusion that

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these dependent claims are not patentable over the cited references. Similarly, applicants' decision not to discuss differences between the prior art and every claim element, or every comment made by the Examiner, should not be considered as an admission that applicants concur with the Examiner's interpretation and assertions regarding those claims. Indeed, applicants believe that all of the dependent claims patentably distinguish over the references cited. However, a specific traverse of the rejection of each dependent claim is not required, since dependent claims are patentable for at least the same reasons as the independent claims from which the dependent claims ultimately depend.

Discussion of Steps (a), (b), and (c)

With regard to independent Claim 1, the Examiner asserts that Sull discloses applicants' step (a), which previously recited in an earlier amendment "accessing data defining the image to produce a representation of the image," and step (c), which previously recited in an earlier amendment "rendering a modified image in accord with the modification to the representation." The Examiner cites sections 0070, 0523, 0037, and 0081 of Sull in support of his assertion that the reference discloses step (a) and cites section 0165 of the reference in support of his assertion regarding step (c). These citations from Sull are reproduced below.

> [0070] The present invention further provides a new approach to editing video materials, in which it **only virtually edits the metadata of input videos** to create a new video, instead of actually editing videos stored as computer files. In the present invention, the virtual editing is performed either by **copying the metadata of a video segment of interest in an input metafile** or copying only the URI of the segment into a newly constructed metafile. The present invention provides a way of playing the newly edited video only with its metadata. The present invention also provides a system for the virtual editing. The present invention can be applied not only to videos stored on CD-ROM, DVD, and hard disk, but also to streaming videos over a network. (Emphasis added, Sull, paragraph 0070.)

> [0523] The content analyzer 4508 analyzes the video, namely the scene of video frames, to find their type and purpose, the motion vector direction, and face/text, etc. Based on this information, the content selection module 4510 and the manipulation module 4514 transcode the video by selecting adaptively the attention area that is defined by a position and size for a rectangular window, for example, in a video that is intended to fit the size of the respective client display. The system 4500 will select a dynamically transcoded (for example, scaled and/or cropped) area in the video without degrading the perceptibility of users. Also, this system has the manual editing routine that alters/adjusts manually the position and size of the transcoded area by the publisher and author. (Sull, paragraph 0523.)

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[0037] When an image is transmitted to a variety of client devices with different display sizes, a scaling mechanism, such as format/resolution change, bit-wise data size reduction, and object dropping, is needed. More specifically, when an image is transmitted to a variety of client devices with different display sizes, a system should *generate a transcoded (e.g., scaled and cropped) image to fit the size of the respective client display*. The extent of transcoding depends on the type of objects embedded in the image, such as cards, bridges, face, and so forth. Consider, for example, an image containing an embedded text or a human face. If the display size of a client device is smaller than the size of the image, sub-sampling and/or cropping to fit the client display must reduce the spatial resolution of the image. Users very often in such a case have difficulty in recognizing the text or the human face due to the excessive resolution reduction. Although the importance value may be used to provide information on which part of the image can be cropped, it does not provide a quantified measure of perceptibility indicating the degree of allowable transcoding. For example, the prior art does not provide the quantitative information on the allowable compression factor with which the important regions can be compressed while preserving the minimum fidelity that an author or a publisher intended. The InfoPyramid does not provide either the quantitative information about how much the spatial resolution of the image can be reduced or ensure that the user will perceive the transcoded image as the author or publisher initially intended. (Sull, paragraph 0037.)

[0081] The present invention also provides a novel scheme for generating transcoded (scaled and cropped) image to fit the size of the respective client display when an image is transmitted to a variety of client devices with different display sizes. The scheme has two key components: 1) perceptual hint for each image block, and 2) an image transcoding algorithm. For a given semantically important block in an image, the perceptual hint provides the information on the minimum allowable spatial resolution. Actually, it provides a quantitative information on how much the spatial resolution of the image can be reduced while ensuring that the user will perceive the transcoded image as the author or publisher want to represent it. The image transcoding algorithm that is basically a content adaptation process selects the best image representation to meet the client capabilities while delivering the largest content value. The content adaptation algorithm is modeled as a resource allocation problem to maximize the content value. (Sull, paragraph 0081.)

[0165] Finally, the indexing methods of the present invention are enhanced by the unique modification of visual rhythm techniques that are part of other methods of the present invention. Modification of prior art visual rhythm techniques enable the system of the present invention to capture text information in the form of captions that are embedded into multimedia information, and even from video streams as they are broadcast, so that text information about the multimedia information can be included in the multimedia bookmarks of the present invention and utilized for storing, indexing, searching, retrieving, editing and rendering of the information. (Sull, paragraph 0165.)

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However, note that the recitation of steps (a), (b), and (c) indicates at least that: (1) data that define ***the media object*** are accessed; (2) the data accessed are used to produce a representation of a media object, producing metadata that define the modification; and (3) a **modified** media object that is in accord with a modification to the representation is rendered. Thus, it can be appreciated from these steps that an important aspect of applicants' independent Claim 1 is that it recites the use of not only **data** but also **metadata**. **Data** is expressly recited in applicants' step (a), and **metadata** is specifically recited as being produced ***to define the modification***. Step (d) recites that the modified image rendered in accord with the modification to the representation in step (c) is done with metadata that is stored in applicants' step (d). Also note that another important aspect, a temporal aspect of applicants' independent Claim 1, is that applicants' metadata does not come into existence until applicants' step (b) is performed, i.e. the metadata are produced when the modification is done in step (b). The modified media object is then rendered in accord with the modification to the representation, as recited in step (d), and the metadata define the modification that is applied when rendering the media object with the modification.

In contrast, the citations to Sull provided by the Examiner fail to teach or suggest all of these aspects included in the recitation of step (a) - step (c). Note that Sull expressly discloses metadata in paragraph 0070, clearly indicating that the metadata in Sull are already in existence. Sull teaches in the bold font citation above that there is virtual editing of the metadata, and this editing is performed by copying the metadata of a video segment of interest that is in an input metafile. So, the metadata already exists in Sull and editing is performed on the existing metadata. This is not what applicants' are reciting in their claim steps (a) through (c). First, data are accessed that define the media object, and then, a modification is performed that produces metadata that are stored in step (d). Thus, Sull does not teach or suggest all of the recitation of steps (a) through (c).

The Examiner has cited other portions of Sull in addition to paragraph 0070, in support of his assertion that Sull anticipates these claims. But, applicants note that Sull has expressly utilized the term "metadata" in explaining how a video file is edited. No mention of the term metadata appears in the other citations. Accordingly, it is apparent that only paragraph 0070 of Sull is relevant of all the citations, because that paragraph is the only one of the citations that even discusses metadata. For example, the discussion of paragraph 0523 of Sull simply discusses a generally conventional approach to automatically cropping a video frame to enable it to fit on a smaller display device, and

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mentions in passing that a user can be provided the option to manually edit the automated cropping and position of the cropped portion of the video frame. There is no mention of metadata in paragraph 0523 of Sull, and thus, that citation is not particularly relevant to applicants' claims.

Further Discussion of Steps (b) and (d) in Regard to Wee

Significant differences exist between applicants' Claim 1 and the cited art because it does not appear the cited art teaches the claim recitation of selectively editing the representation of a media object and storing metadata without modifying the data that define the media object.

With respect to independent Claim 1, the Examiner asserts that Wee discloses applicants' step (b) that previously recited in an earlier amendment "enabling a user to selectively edit the representation of the image by applying a modification to the representation, wherein the modification comprises the step of selectively cropping the representation," as well as step (d) that recited "storing metadata that define the modification applied to the representation in association with the image, without modifying the data that define the image, said metadata defining a selected size and a selected position of a crop outline on the representation of the image that is provided to indicate limits of a cropped image." The Examiner cited column 30, lines 30-53 in support of his assertion regarding step (b) and cited column 11, lines 10-32 in support of his assertion regarding step (d). These citations are reproduced below:

> The second image or sequence 507 is modified as desired by the user; preferably, the software affords the user the opportunity to view the second image or sequence overlaid upon the first image, *and to crop, scale and change the perspective of the second image*. Accordingly, the second image or sequence is adjusted by the user to be roughly compatible with its destination within the video input, as indicated by reference numerals 513 and 515. The software takes the second image or sequence and maps that information as modified by the user to the dimensions of the decoded spatial regions, and fits substitute image data into the original regions of the video input (or at least within a selected object of the original regions). Preferably, the user is afforded the opportunity (via visual display, zoom and a user interface such as a mouse) to further crop the substitute image data, or to make that data translucent over the original image data. The software also preferably affords the user menu functions to fit accelerated or decelerated display of the second image (sequence) with respect to the original image data (e.g., via frame dropping), or to reverse play of the second image (sequence) with respect to the video input, or to splice several image sequences together to form replacement image data for a region. These functions are indicated by reference numerals 517, 519, 521 and 525. (Wee, column 30, lines 30-53.)

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> Once regions have been selected by the user and defined over the desired frame range of interest, the image processing system then encodes (or transcodes) the selected range of video, as indicated by master function block 115. During this process, if prior compression data is available for data which has been unaltered, that data is preferably re-used to save time that might otherwise be required in computing new compression data for unaltered regions, as indicated by block 117. Details are described below for one system that permits image processing software to track exactly which image frames have altered and in which manner alteration has been occurred. As part of the preferred encoding process and format, a region map can be developed for each frame of a group of pictures ("GOP") which indicates how each ICR is to be "sliced." The GOP is then compressed according to these region maps, and the result of this process ideally is a bit stream with independently coded regions. These operations are indicated, respectively, by blocks 119, 121 and 123. The bit stream is then suitable for storage or transmission, and is inherently suited for optional editing a portion of the bit stream without having to completely decode each entire frame of interest, as indicated by an optional process block 125. (Wee, column 11, lines 10-32.)

However, note that the recitation of applicants' step (b) in Claim 1 indicates that: (1) a user is enabled to selectively edit the representation of the media object; and (2) this editing is carried out by making a modification to the representation, producing metadata that define the modification. Wee does not teach or suggest the step of selectively editing the representation of a media object. The Examiner has not indicated which elements in the above citation to Wee that he believes are equivalent to applicants' claim recitation. However, applicants recite editing the representation (e.g., a display) of a media object (e.g., a first image) and then modifying the representation (e.g., a displayed image) by selectively editing it, producing metadata that define the modification. Wee recites in column 30, lines 4-20 that it may be desired to replace, for example, a graphic showing a billboard with a second image. Specifically, Wee recites the example of replacing an English language sign (in a first image of the billboard) with a Chinese language equivalent in a second image. In contrast, applicants recite in step (b) that it is the representation (e.g., display) of the media object (e.g., an image), not a second image that a user is enabled to selectively edit. This modification to the representation (e.g., an image), might include the step of cropping the representation if the media object is an image. In contrast, Wee teaches that the user is able *"to crop, scale and change the perspective of the second image."* Thus, Wee is teaching cropping a second image; Wee is not teaching selectively editing the representation of a display of a single media object, which would correspond to the first image in Wee.

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Applicants' step (d) recites at least three aspects of the claim pertaining to metadata, including: (1) metadata are stored in association with the media object; (2) the metadata define the modification applied to the representation of the media object; and (3) the metadata do not modify the data defining the media object. The Examiner has not indicated which elements he believes are equivalent to applicants' claim recitation in regard to these three aspects of the claim. If the Examiner believes that an independently coded region of the selected range of video is equivalent to metadata, then applicants note that it does not appear that Wee teaches that the ICR (which is presumably what the Examiner believes corresponds to applicants' recited metadata) do not modify the data defining the media object. Wee appears to teach that a permanent alteration to the data defining the media object has taken place. Specifically, Wee gives the example of a desire to edit a region, for example, to change the color of a particular actor's shirt. Wee teaches that this color correction may be accomplished by inserting a color corrected signal that is re-encoded into bit stream format and inserted in the place of the original bit stream data for the set of actors (Wee, column 9, lines 15-21).

Accordingly, the rejection of independent Claim 1 under 35 U.S.C. § 103(a) over Sull and further in view of Wee should be withdrawn, for the reasons given above, since the combined cited references do not teach or suggest all of the recitation of independent Claim 1.

Claims 3-12 ultimately depend from independent Claim 1. Because dependent claims inherently include all of the steps or elements of the independent claim from which the dependent claims ultimately depend, dependent Claims 3-12 are patentable for at least the same reasons discussed above with regard to independent Claim 1. Accordingly, the rejection of dependent Claims 3-12 under 35 U.S.C. § 103(a) over Sull and further in view of Wee should be withdrawn.

Discussion of the Rejection of Independent Claim 14

Independent Claim 14 is directed towards a system for lossless editing of a media object and subparagraphs (d)(i) through (iv) are similar to steps (a) through (d) of independent Claim 1. However, this time the Examiner has cited Sull only in regard to his rejection of subparagraph (d)(i) and has cited Wee in regard to his rejection of subparagraphs (d)(ii), (d)(iii), and (d)(iv). Therefore, applicants' comments traversing the rejection of independent Claim 1 are equally applicable to show the patentability of applicants' independent Claim 14.

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Accordingly, the rejection of independent Claim 14 under 35 U.S.C. § 103(a) over Sull and further in view of Wee should be withdrawn, for the reasons given above, since the combined cited art does not teach or suggest all of the recitation of independent Claim 14.

Claims 16 and 18-24 ultimately depend from independent Claim 14. Because dependent claims inherently include all of the steps or elements of the independent claim from which the dependent claims ultimately depend, dependent Claims 16 and 18-24 are patentable for at least the same reasons discussed above with regard to independent Claim 14. Accordingly, the rejection of dependent Claims 16 and 18-24 under 35 U.S.C. § 103(a) over Sull and further in view of Wee should be withdrawn.

Discussion of the Rejection of Independent Claim 25

Independent Claim 25 is directed towards a method for lossless modification of a media object. Applicants respectfully disagree with this rejection, at least because Sull and Wee neither teach nor suggest applicants' step (h), contrary to the Examiner's assertion. The differences between the recitation of the claim and the cited references that are discussed above in regard to applicants' Claim 1 also apply in traversing the rejection of Claim 25. In addition, there are further differences between this claim and the cited art, as discussed below.

The Examiner asserts that Wee teaches applicants' step (h), which recites "storing metadata that now define the second modification of the image, without modifying the data that define the image," and the Examiner cites column 11, lines 10-32 of Wee in support of this assertion. But again, as noted above in connection with independent Claim 1, the original bit stream in Wee appears to be permanently edited since a signal is re-encoded into bit stream format and inserted in the place of the original bit stream data (Wee, column 9, lines 17-20). Also, Wee does not appear to teach or suggest a second modification, producing metadata that define the second modification, wherein the metadata that define the second modification are stored.

Accordingly, the rejection of independent Claim 25 under 35 U.S.C. § 103(a) over Sull and further in view of Wee should be withdrawn, for the reasons given above, since the combined cited art do not teach or suggest all of the recitation of independent Claim 25.

Claims 26, and 28-30 ultimately depend from independent Claim 25. Because dependent claims inherently include all of the steps or elements of the independent claim from which the dependent claims ultimately depend, dependent Claims 26 and 28-30 are patentable for at least the

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same reasons discussed above with regard to independent Claim 25. Accordingly, the rejection of dependent Claims 26 and 28-30 under 35 U.S.C. § 103(a) over Sull and further in view of Wee should be withdrawn.

Claims Rejected under 35 U.S.C. § 102(e)

The Examiner has rejected Claims 31-32 and 34-37 as being anticipated by Sull. The Examiner asserts that Sull describes each element of applicants' claimed invention. Applicants respectfully disagree for the reasons noted below.

Discussion of the Rejection of Independent Claim 31

Independent Claim 31 is directed towards a system for lossless modification of a media object and generally corresponds to independent method Claim 25. Thus, as explained above in connection with independent Claim 1, which recites steps similar to step (c)(i) and step (c)(iii), Sull does not teach or disclose metadata in a manner equivalent to that of applicants' recited claim steps. In addition, it also follows that the cited reference does not teach step (c)(viii) of Claim 31, because metadata as defined by Sull exists before any modifications are performed and are not produced as result of a modification. Further, the metadata that define the modification are not stored by Sull, as recited in this claim.

Accordingly, the rejection of independent Claim 31 under 35 U.S.C. § 102(e) over Sull should be withdrawn, for the reasons given above, since Sull does not teach all of the recitation of independent Claim 31.

Claims 32 and 34-35 ultimately depend from independent Claim 31. Because dependent claims inherently include all of the steps or elements of the independent claim from which the dependent claims ultimately depend, dependent Claims 32 and 34-35 are patentable for at least the same reasons discussed above with regard to independent Claim 31. Accordingly, the rejection of dependent Claims 32 and 34-35 under 35 U.S.C. § 102(e) over Sull should be withdrawn.

Discussion of the Rejection of Independent Claim 36

Independent Claim 36 is directed towards a machine readable medium having a data structure for lossless modification of a media object. The Examiner asserts that applicants' step (a) is disclosed by paragraph 0165 with the addition of paragraph 0523 disclosing the cropping element of applicants' claim limitation. In addition, the Examiner asserts that the applicants' step (b) is disclosed by sections 0070, 0165, and 0523. However, there is no teaching in Sull of a data structure

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that stores both **metadata** and the **data** defining the image. Note that data defining a media object that is used to produce a representation are not the same as the metadata produced to define the modification of the media object.

Accordingly, the rejection of independent Claim 36 under 35 U.S.C. § 102(e) over Sull should be withdrawn, for the reasons given above, since Sull does not teach all of the recitation of independent Claim 36.

Discussion of the Rejection of Independent Claim 37

Independent Claim 37 is directed towards a machine-readable medium having a data structure for a collection of media objects comprising a substorage. For the reasons presented above in connection with independent Claim 36, it does not appear that Sull discloses a data structure that stores both metadata that define a modification and the data defining a media object.

Accordingly, the rejection of independent Claim 37 under 35 U.S.C. § 102(e) over Sull should be withdrawn, for the reasons given above, since Sull does not teach all of the recitation of independent Claim 37.

In view of the Remarks set forth above, it will be apparent that the claims remaining in this application define a novel and non-obvious invention, and that the application is in condition for allowance and should be passed to issue without further delay. Should any further questions remain, the Examiner is invited to telephone applicants' attorney at the number listed below.

Respectfully submitted,

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